CLAIMS

What is claimed:

1   1.   A method for cell replication comprising:

2   receiving a request for data transmission through a crossbar and a

3   corresponding mapping information, the mapping information received by

4   the crossbar and received from one of a plurality of software configurable slot

5   remap registers, the mapping information indicative of a destination slot and

6   a backup destination slot to which the data is to be transmitted; and

7   replicating the data by transmitting the data to the destination slot and

8   to the backup destination slot when the data arrives at an input slot of the

9   crossbar.

1   2.   The method of claim 1 further comprising determining whether

2   the destination slot and the backup destination slot to grant the request are

3   available, the availability determined by a scheduler.

1   3.   The method of claim 2 further comprising transmitting a control

2   signal to the crossbar once availability is confirmed, the control signal

3   transmitted by the scheduler and indicative of the availability of the

4   destination slot and the backup destination slot.

1   4.   The method of claim 3 further comprising sending an

2   acknowledgment back to a source of the request.

1   5.   An apparatus for cell replication comprising:

2   a crossbar to direct data traffic; and

3   a scheduler coupled to the crossbar, the scheduler comprising a

4   plurality of signal inputs and a plurality of signal outputs and configured to

5   provide control signals to the crossbar, the plurality of signal inputs being

6   requests for data transmission through the crossbar, and the plurality of signal

7   outputs being grants to the requests, data for which a request for transmission

8   is granted by the scheduler is replicated and processed through the crossbar to

9   a destination slot and to a backup destination slot according to software

10   configurable mapping information.

1   6.   The apparatus of claim 5 wherein the crossbar is further

2   comprised of a plurality of data in signals and a plurality of data out signals

3   and is a spatial crossbar.

1   7.   The apparatus of claim 6 further comprising a plurality of slot

2   remap registers coupled to the crossbar and the scheduler, the plurality of slot

3   remap registers being software configurable and configured to provide the

4   mapping information to the crossbar and the scheduler, the mapping

5   information identifies the data out destination slots of the crossbar to which

6   data is to be transmitted through the crossbar.

1   8.   The apparatus of claim 7 wherein each the plurality of slot

2   remap registers corresponds with one of the plurality of data in signals of the

3   crossbar.

1   9.   The apparatus of claim 8 wherein each the plurality of slot

2   remap registers corresponds with a sequential one of the plurality of data in

3   signals of the crossbar.

1   10.   The apparatus of claim 8 wherein the scheduler receives

2   mapping information indicative of the destination slot and the backup

3   destination slot from the slot remap register when a request comes in to one

4   of the plurality of input slots.

1   11.   The apparatus of claim 10 wherein the scheduler determines

2   whether the destination slot and the backup destination slot as identified by

3   the mapping information for the specific input slot are available.

1   12.   The apparatus of claim 11 wherein the scheduler transmits a

2   control signal to the crossbar which indicates that data in slot is permitted to

3   send a cell to its intended the destination slot and the backup destination slot

4   once the availability is confirmed.

1   13.   The apparatus of claim 12 wherein the scheduler sends an

2   acknowledgment back to a source of the request.

Sub A'   14.   A network switch system comprising:

2   a plurality of processor cards comprising a central processing unit and

3   high level software;

4   a plurality of switch cards coupled to the plurality of processor cards

5   and implemented with a cell replication feature, the plurality of switch cards

6   comprises of a plurality of switch planes; and

7   a plurality of line cards coupled to the plurality of switch cards, the

8   plurality of line cards to interface the plurality of switch cards with traffic

9   coming in and out of a plurality of physical ports.

Sub B' 1   15.   The system of claim 14 wherein the cell replication feature

2   further comprises:

3   a crossbar to direct data traffic; and

4   a scheduler coupled to the crossbar, the scheduler comprising a

5   plurality of signal inputs and a plurality of signal outputs and configured to

6   provide control signals to the crossbar, the plurality of signal inputs being

7   requests for data transmission through the crossbar, and the plurality of signal

8   outputs being grants to the requests, data for which a request for transmission

9   is granted by the scheduler is replicated and processed through the crossbar to

10   a destination slot and to a backup destination slot according to software

11   configurable mapping information.

1   16.   The system of claim 15 wherein the crossbar is further comprised

2   of a plurality of data in signals and a plurality of data out signals and is a

3   spatial crossbar.

1   17.   The system of claim 16 further comprising a plurality of slot

2   remap registers coupled to the crossbar and the scheduler, the plurality of slot

3   remap registers being software configurable and configured to provide the

4   crossbar and the scheduler the mapping information which identifies the data

5   out destination slots of the crossbar to which data is to be transmitted through

6   the crossbar.

1   18.   The system of claim 17 wherein each the plurality of slot remap

2   registers corresponds with one of the plurality of data in signals of the

3   crossbar.

1   19.   The system of claim 18 wherein each the plurality of slot remap

2   registers corresponds with a sequential one of the plurality of data in signals

3   of the crossbar.

1   20.   The system of claim 19 wherein the scheduler receives mapping

2   information indicative of the destination slot and the backup destination slot

3   from the slot remap register when a request comes in to one of the plurality

4   of input slots.

1   21.   The system of claim 20 wherein the scheduler determines

2   whether the destination slot and the backup destination slot as identified by

3   the mapping information for the specific input slot are available.

1   22.   The system of claim 21 wherein the scheduler transmits a

2   control signal to the crossbar which indicates that data in slot is permitted to

3   send a cell to its intended the destination slot and the backup destination slot

4   once the availability is confirmed.

1   23.   The system of claim 22 wherein the scheduler sends an

2   acknowledgment back to a source of the request.

SUB A

1   24.   An apparatus for cell replication comprising:

2   mean for directing data traffic; and

3   means for controlling the means for directing, the means for

4   controlling coupled to the means for directing comprising a plurality of signal

5   inputs and a plurality of signal outputs and configured to provide control

6   signals to the means for directing, the plurality of signal inputs being requests

7   for data transmission through the means for directing, and the plurality of

8   signal outputs being grants to the requests, data for which a request for

9   transmission is granted by the means for controlling is replicated and

10   processed through the means for directing to a destination slot and to a

11   backup destination slot according to software configurable mapping

12   information.

1   25.   The apparatus of claim 24 wherein the means for directing is

2   further comprised of a plurality of data in signals and a plurality of data out

3   signals and is a spatial crossbar.

1   26.   The apparatus of claim 25 further comprising a plurality of

2   means for storing coupled to the means for directing and the means for

3   controlling, the plurality of means for storing being software configurable and

4   configured to provide the mapping information to the means for directing

5   and the means for controlling, the mapping information identifies the data

6   out destination slots of the means for directing to which data is to be

7   transmitted through the means for directing.

1   27.   The apparatus of claim 26 wherein each the plurality means for

2   storing corresponds with one of the plurality of data in signals of the means

3   for directing.

1   28.   The apparatus of claim 27 wherein each the plurality means for

2   storing corresponds with a sequential one of the plurality of data in signals of

3   the means for directing.

1   29.   The apparatus of claim 28 wherein the means for controlling

2   receives mapping information indicative of the destination slot and the

3   backup destination slot from the means for storing when a request comes in

4   to one of the plurality of input slots.

1   30.   The apparatus of claim 29 wherein the means for controlling

2   determines whether the destination slot and the backup destination slot as

3   identified by the mapping information for the specific input slot are available.

1   31.   The apparatus of claim 30 wherein the means for controlling

2   transmits a control signal to the means for directing which indicates that data

3   in slot is permitted to send a cell to its intended the destination slot and the

4   backup destination slot once the availability is confirmed.

1   32.   The apparatus of claim 31 wherein the means for controlling

2   sends an acknowledgment back to a source of the request.